What Is Claimed Is:

1. Highly durable silica glass comprising 0.01% to 2% by weight, based on the weight of the silica glass, of at least one element selected from the group consisting of magnesium, calcium, strontium, barium, yttrium, hafnium and zirconium.

2. Highly durable silica glass according to claim 1, wherein the content of said element is in the range of 0.05% to 0.5% by weight based on the weight of the silica glass.

3. Highly durable silica glass according to claim 1, wherein said element is zirconium and the silica glass is transparent.

4. Highly durable silica glass according to claim 1, wherein said element is zirconium and the silica glass exhibits a variant coefficient of zirconium concentration as measured on plural micro-regions by an EPMA (X-ray micro analyzer) in the range of 0.1% to 100%; said variant coefficient being defined by the following equation:

$$\text{Variant coefficient}\ (\%) = \sigma / C \times 100$$

wherein σ is standard deviation and C is concentration of zirconium.

5. A silica glass member for use in an apparatus using a halogen-containing compound gas and a plasma thereof; said member being made of highly durable silica glass as claimed in claim 1.

6. A semiconductor-producing apparatus equipped with a silica glass member as claimed in claim 5.

7. A liquid crystal-producing apparatus equipped with a silica glass member as claimed in claim 5.

8. A process for producing a highly durable silica glass ingot comprising simultaneously falling a finely divided silica powder and a finely divided zirconium-containing substance in a furnace using oxyhydrogen flame as heat source to form an accumulated layer of zirconium-containing silica on a bottom of the furnace; and extending the accumulated layer to outwardly

radial directions, to f rm an ingot wherein zirconium is uniformly dispersed in a silica glass matrix.

9. The process for producing a highly durable silica glass ingot according to claim 8, wherein the finely divided silica powder and the finely divided zirconium-containing substance are fallen as a finely divided silica powder having deposited thereon a finely divided zirconium-containing substance.

10. The process for producing a highly durable silica glass ingot according to claim 8, wherein the finely divided silica powder and the finely divided zirconium-containing substance are fallen as a mixture of the silica powder and the zirconium-containing substance powder.

11. The process for producing a highly durable silica glass ingot according to claim 8, wherein the finely divided silica powder and the finely divided zirconium-containing substance are separately fallen.

12. The process for producing highly durable silica glass according to claim 8, wherein the finely divided silica powder and the finely divided zirconium-containing substance are fallen in a manner such that the silica powder and the zirconium-containing substance are contacted with the oxyhydrogen flame as heat source to form an accumulated layer of zirconium-containing silica, and the accumulated zirconium-containing silica layer is maintained at a temperature sufficiently high for keeping a molten state to be thereby extended outwardly in radial directions.

13. The process for producing a highly durable silica glass ingot according to claim 8, wherein the amount of the finely divided zirconium-containing substance is such that the weight of zirconium is in the range of 0.01% to 2% by weight, based on the weight of the sum of the finely divided silica powder and the finely divided zirconium-containing substance.

14. The process for producing a highly durable silica glass ingot according to claim 8, wherein the finely divided

zirconium-containing substance powder has an averag particle diameter in th rang of 0.1 to 300 μm.

15. The process for producing a highly durable silica glass ingot according to claim 8, wherein the zirconium-containing substance is at least one kind of substance selected from metallic zirconium and zirconium compounds.

16. The process for producing a highly durable silica glass ingot according to claim 8, wherein the zirconium-containing substance is zirconia.

17. The process for producing a highly durable silica glass ingot according to claim 8, wherein the finely divided silica powder is a finely divided powder of high-purity silicon oxide.

18. The process for producing a highly durable silica glass ingot according to claim 17, wherein the high-purity silica powder is at least one silica powder selected from the group consisting of silica sand, rock crystal powder, α-quartz and cristobalite.

19. An apparatus for producing a highly durable silica glass ingot comprised of silica and zirconium, wherein zirconium is uniformly dispersed in a silica glass matrix, said apparatus comprising (i) a furnace rotatable round its own axis, (ii) a feed means for allowing a finely divided silica powder and a finely divided zirconium-containing substance to simultaneously fall within the furnace, said feed means being fitted on a top of the furnace; and (iii) a burner for projecting oxyhydrogen flame, said burner being fitted on a top of the furnace.

20. The apparatus for producing a highly durable silica glass ingot according to claim 19, which further comprises a means for rotating the furnace around its own axis located in the center or a vicinity thereof.

21. The apparatus for producing a highly durable silica glass ingot according to claim 19, wherein said feed means (ii) comprises at least one feed assembly;

the r each feed assembly c mprising (1) a feed hopper for f eding a p wdery material which is a fin ly divid d silica powder or a finely divided zirconium-containing substance or a mixture of the two powders or a finely divided silica powder having deposited thereon a finely divided zirconium-containing substance, said feed hopper having an opening at the lower end thereof; (2) a rotatable table for receiving the powdery material fed through the opening of the feed hopper; (3) an equalizer for extending and making uniform in height a heap of the powdery material placed on the table, and (4) a scraper for removing the powdery material having a uniform height from the table.

22. The apparatus for producing a highly durable silica glass ingot according to claim 19, wherein said furnace has side walls made of silicon carbide bricks.

23. The apparatus for producing a highly durable silica glass ingot according to claim 19, wherein said furnace has a bottom covered with zirconia particles.

24. A process for producing a highly durable silica glass ingot comprising allowing a powdery material comprising a finely divided silica powder and a finely divided zirconium-containing substance to pass through a plasma arc-coupled region or a vicinity thereof whereby the powdery mixture is molten; and collecting the molten material; said plasma arc-coupled region being formed by coupling at least two plasma arcs generated by at least two electrodes having different polarities.

25. The process for producing a highly durable silica glass ingot according to claim 24, wherein the electrodes are arranged symmetrically and inclined relative to a path of the powdery material in a fashion that plasma arc-generating tips of the electrodes are inwardly directed, wherein the inclination angle of each electrode and the distance from the plasma arc-coupled region to the collected molten material are capable of being independently varied so that transmittance of a resulting highly durable silica glass ingot can be controlled.

26. Th process for producing a highly durable silica glass ing t according to claim 24, wherein at least ne of the electrodes functions as a cathode and the other electrode or electrodes function as an anode; and the cathode and the anode are inclined so that an inclination angle from the perpendicular axis is in the range of 45 to 65 degree or the angle between the cathode and the anode is in the range of 80 to 130 degree; and the distance between the tips of cathode and anode is maintained within 100 mm or the distance from the plasma arc-coupled region to the collected molten material is maintained within 100 mm.

27. The process for producing a highly durable silica glass ingot according to claim 24, wherein the molten material is collected on a target while the target is rotated round the vertical axis or upwardly moved in the vertical direction, or while the target is rotated round the vertical axis and, simultaneously therewith, is upwardly moved in the vertical direction.

28. The process for producing a highly durable silica glass ingot according to claim 24, wherein the molten material is collected on a central part of the bottom of a vessel while the vessel is rotated round the vertical axis thereof, and the collected molten material is maintained at a temperature sufficiently high for allowing the collected molten material to extend outwardly in radial directions.

29. The process for producing a highly durable silica glass ingot according to claim 24, wherein the amount of the finely divided zirconium-containing substance is such that the weight of zirconium is in the range of 0.01% to 2% by weight, based on the weight of the sum of the finely divided silica powder and the finely divided zirconium-containing substance.

30. The process for producing a highly durable silica glass ingot according to claim 24, wherein the finely divided zirconium-containing substance has an average particle diameter in the range of 0.1 to 300 μm.

31. Th process for producing a highly durable silica glass ingot acc rding to claim 24, wherein the zirconium-containing substance is at least one kind of substance selected from the group consisting of metallic zirconium and zirconium compounds.

32. The process for producing a highly durable silica glass ingot according to claim 31, wherein the zirconium-containing substance is zirconia.

33. The process for producing a highly durable silica glass ingot according to claim 24, wherein the finely divided silica powder is a finely divided powder of high-purity silicon oxide.

34. The process for producing a highly durable silica glass ingot according to claim 33, wherein the high-purity silicon oxide powder is at least one silica powder selected from the group consisting of silica sand, rock crystal powder, α-quartz and cristobalite.